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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/691,533	10/18/2000	Charles David Bauman	RPS920000076US1	5366

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Dillon & Yudell LLP
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EXAMINER

TRUONG, BAO Q

ART UNIT	PAPER NUMBER
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2187

DATE MAILED: 04/21/2004

10

Please find below and/or attached an Office communication concerning this application or proceeding.

OR

Office Action Summary

Application No.

09/691,533

Applicant(s)

BAUMAN ET AL.

Examiner

Bao Q Truong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22-24 is/are allowed.
- 6) ☒ Claim(s) 1,2,6,7,11,12,16,17 and 21 is/are rejected.
- 7) ☒ Claim(s) 3-5,8,9,13-15 and 18-20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 October 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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Response to Amendment

1. The examiner acknowledges the applicant's submission of Amendment for Application No. 09/691,533, dated on 4 March 2004. Claims 1, 6, 11, 16, and 21 have been amended. Claims 23-24 have been added. At this point, the application has a total of 24 claims pending. There are 8 independent claims and 16 dependent claims, all of which are ready for examination by the examiner.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 6, 11, 16, and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Voigt et al. (U.S. Patent No. 6,055,604).

This rejection is being applied for the same reasons as set forth in the previous Office Action on 26 November 2003.

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Referring to claim 1, Voigt teaches a method of handling a memory exhaustion condition in a data processing system having first and second regions of physical memory (see figure 2: elements 55 and 60), said method comprising:

detecting a memory exhaustion condition while said second region is mirroring at least part of said first region as detecting a page-full status of a ram log image area while a disk log area is mirroring the ram log image area for error recovery purpose (see figure 2, column 2: lines 3-11, and column 5: lines 22-28 and 41-46);

in response to said memory exhaustion condition, at least partially deactivating memory mirroring between said first and second regions; and augmenting said first region with at least part of said second region, such that said memory exhaustion condition is eliminated as posting unwritten contents of the ram log image area to disk log area without maintaining redundancy, in response to the page-full status of the ram log image area (see column 5: lines 47-61).

Referring to claim 6, Voigt discloses a data processing system comprising:

first and second regions of physical memory (see figure 2: elements 55 and 60);

detection logic (see figure 2: element 16) that detects a memory exhaustion condition while said second region is mirroring at least part of said first region as the raid management system detects a page-full status of a ram log image area while a disk log area is mirroring the ram log image area for error recovery purpose (see column 2: lines 3-11, and column 5: lines 22-28 and 41-46);

configuration logic (see figure 2: element 16) that, in response to said memory exhaustion condition, at least partially deactivates memory mirroring between said first and second regions

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and augments said first region with at least part of said second region, such that said memory exhaustion condition is eliminated as the raid management system posts unwritten contents of the ram log image area to disk log area without maintaining redundancy, in response to the page-full status of the ram log image area (see column 5: lines 47-61).

Referring to claim 11, Voigt teaches the method, as in claim 1 above, in a computer environment. Inherently, the method can be implemented as a computer program, stored in a computer usable medium, encodes instructions to perform the method as in claim 1.

Referring to claim 16, Voigt discloses a memory management system that handles a memory exhaustion condition in a data processing system having first and second regions of physical memory (see figure 2: elements 55 and 60), said memory management system comprising:

detection logic (see figure 2: element 16) that detects a memory exhaustion condition while said second region is mirroring at least part of said first region as the raid management system detects a page-full status of a ram log image area while a disk log area is mirroring the ram log image area for error recovery purpose (see column 2: lines 3-11, and column 5: lines 22-28 and 41-46);

configuration logic (see figure 2: element 16) that, in response to said memory exhaustion condition, at least partially deactivates memory mirroring between said first and second regions and augments said first region with at least part of said second region, such that said memory exhaustion condition is eliminated as the raid management system posts unwritten contents of

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the ram log image area to disk log area without maintaining redundancy, in response to the page-full status of the ram log image area (see column 5: lines 47-61).

Referring to claim 21, Voigt discloses a data processing system comprising:

first and second regions of physical memory (see figure 2: elements 55 and 60);

detection means (see figure 2: element 16) for detecting a memory exhaustion condition while said second region is mirroring at least part of said first region as the raid management system detects a page-full status of a ram log image area while a disk log area is mirroring the ram log image area for error recovery purpose (see column 2: lines 3-11, and column 5: lines 22-28 and 41-46);

configuration means (see figure 2: element 16), responsive to said memory exhaustion condition, for at least partially deactivating memory mirroring between said first and second regions and augmenting said first region with at least part of said second region, such that said memory exhaustion condition is eliminated as the raid management system posts unwritten contents of the ram log image area to disk log area without maintaining redundancy, in response to the page-full status of the ram log image area (see column 5: lines 47-61).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2, 7, 12, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Voigt et al. (U.S. Patent No. 6,055,604) in view of Blumenau (U.S. Patent No. 6,151,665).

This rejection is being applied for the same reasons as set forth in the previous Office Action on 26 November 2003.

As to claim 2, Voigt teaches the method as in claim 1 above. And Voigt further teaches that step of detecting a memory exhaustion condition comprises determining that said first region lacks sufficient available capacity to accommodate current requirement for real memory as determining that the ram log image area lacks sufficient available capacity, due to the page-full status, to retain the incremental changes to a NVRAM map (see column 2: lines 12-16).

However, Voigt does not clearly teach that said data processing system compressing real memory into said first region of physical memory and that step of augmenting said first region comprises compressing at least part of said required real memory into said at least part of said second region.

Blumenau teaches a method of storing data in a mirroring storage system wherein said data is stored in a compressed format (see figure 13 and column 20: lines 5-13).

It would have been obvious to one having an ordinary level of skill in the art at the time the invention was made to further configure the method taught by Voigt such that said data processing system compressing real memory into said first region of physical memory and said step of augmenting said first region comprises compressing at least part of said required real memory into said at least part of said second region. This would have been obvious because Blumenau teaches that data is stored into main memory in a compressed format for the purpose of gaining high storage efficiency (see column 20: lines 39-42).

As to claim 7, Voigt discloses the system as in claim 6 above. And Voigt further discloses that said detection logic comprises a memory controller that detects a memory exhaustion condition by determining that said first region lacks sufficient available capacity to accommodate current requirement for real memory as the raid management system determines that the ram log image area lacks sufficient available capacity, due to the page-full status, to retain the incremental changes to a NVRAM map (see column 2: lines 12-16).

However, Voigt does not clearly disclose that said data processing system compresses real memory into said first region of physical memory and that configuration logic comprises a memory manager that augments said first region by configuring said memory controller to compress at least part of said required real memory into said at least part of said second region.

Blumenau discloses a system of storing data in a mirroring storage system wherein said data is stored in a compressed format (see figure 13 and column 20: lines 5-13).

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It would have been obvious to one having an ordinary level of skill in the art at the time the invention was made to further configure the system taught by Voigt such that said data processing system compresses real memory into said first region of physical memory and that configuration logic comprises a memory manager that augments said first region by configuring said memory controller to compress at least part of said required real memory into said at least part of said second region. This would have been obvious because Blumenau discloses that data is stored into main memory in a compressed format for the purpose of gaining high storage efficiency (see column 20: lines 39-42).

As to claim 12, Voigt teaches the method, as in claim 2 above, in a computer environment. Inherently, the method can be implemented as a computer program, stored in a computer usable medium, encodes instructions to perform the method as in claim 2.

As to claim 17, Voigt discloses the system as in claim 16 above. And Voigt further discloses that said detection logic comprises a memory controller that detects a memory exhaustion condition by determining that said first region lacks sufficient available capacity to accommodate current requirement for real memory as the raid management system determines that the ram log image area lacks sufficient available capacity, due to the page-full status, to retain the incremental changes to a NVRAM map (see column 2: lines 12-16).

However, Voigt does not clearly disclose that said data processing system compresses real memory into said first region of physical memory and that configuration logic comprises a

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memory manager that augments said first region by configuring said memory controller to compress at least part of said required real memory into said at least part of said second region.

Blumenau discloses a system of storing data in a mirroring storage system wherein said data is stored in a compressed format (see figure 13 and column 20: lines 5-13).

It would have been obvious to one having an ordinary level of skill in the art at the time the invention was made to further configure the system taught by Voigt such that said data processing system compresses real memory into said first region of physical memory and that configuration logic comprises a memory manager that augments said first region by configuring said memory controller to compress at least part of said required real memory into said at least part of said second region. This would have been obvious because Blumenau discloses that data is stored into main memory in a compressed format for the purpose of gaining high storage efficiency (see column 20: lines 39-42).

Response to Arguments

6. Applicant's arguments filed on 4 March 2004 have been fully considered but they are not persuasive.

The applicant argues on page 10 that "there is no teaching or suggestion in Voigt that the disk log mirrors the transaction log". The examiner disagrees and directs the applicant's attention to figure 2 and column 5: lines 47-50 of Voigt. Voigt teaches that the disk log 60 is an image of the ram log 55. Therefore, Voigt clearly teaches that "said second region of physical memory is mirroring at least part of said first region".

The applicant's argues on page 10 that "there is no teaching or suggestion of a physical memory overflowing and commandeering space previously used by its mirror copy". The examiner agrees and withdraws the 103 rejections of claims 1, 6, 11, 16, and 21 as being unpatentable over Ohran (U.S. Patent No. 6,397,307 B2) in view of Burkes et al. (U.S. Patent No. 5,542,065) **and** the 103 rejections of claims 2, 7, 12, and 17 as being unpatentable over Ohran (U.S. Patent No. 6,397,307 B2) in view of Burkes et al. (U.S. Patent No. 5,542,065) as applied to claims 1, 6, 11, and 16 above, and further in view of Blumenau (U.S. Patent No. 6,151,665).

Allowable Subject Matter

7. Claims 3-5, 8-9, 13-35, and 18-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Claims 22-24 are allowed.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **three months** from the mailing date of this action. In the event a first reply is filed within **two months** of the mailing date of this final action and the advisory action is not mailed until after the end of the **three-month** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **six months** from the mailing date of this final action.

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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bao Q Truong whose telephone number is (703) 308-7090. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald A Sparks, can be reached on (703) 308-1756. The fax phone number for the organization where this application or proceeding is assigned is (703) 746-7239.

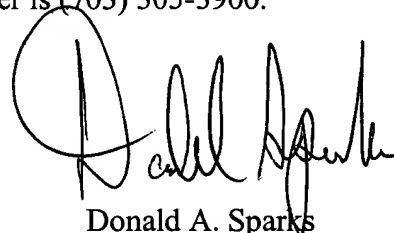
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Bao Q Truong

BT

Patent Examiner

19 April 2004

A handwritten signature in black ink, appearing to read "Donald A. Sparks". The signature is written in a cursive, flowing style with a large initial "D".

Donald A. Sparks

Supervisory Patent Examiner

Technology Center 2100